

FIG. 1A

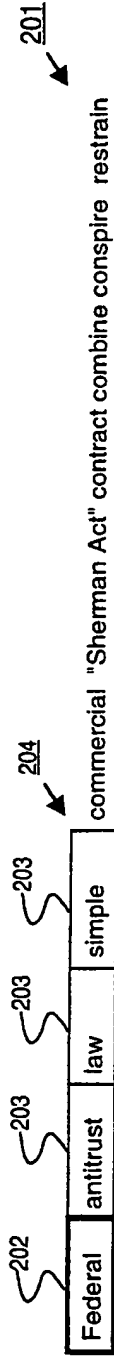


FIGURE 2A

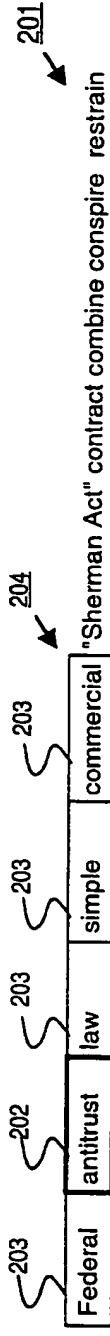


FIGURE 2B

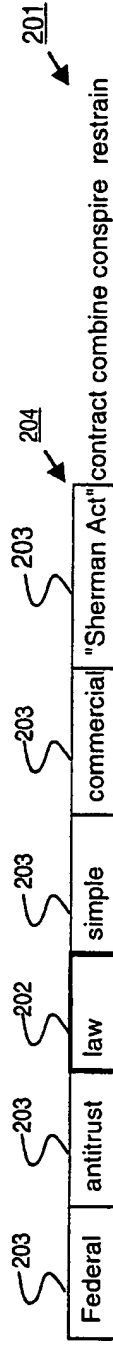


FIGURE 2C

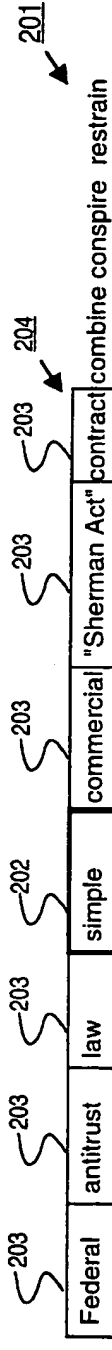


FIGURE 2D

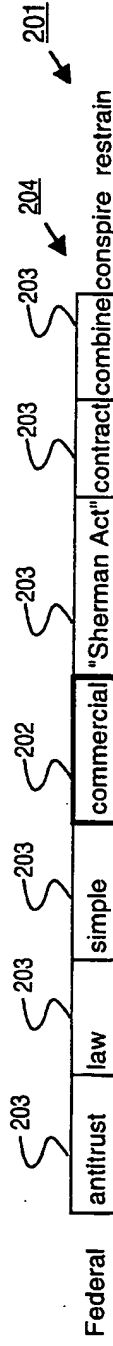


FIGURE 2E

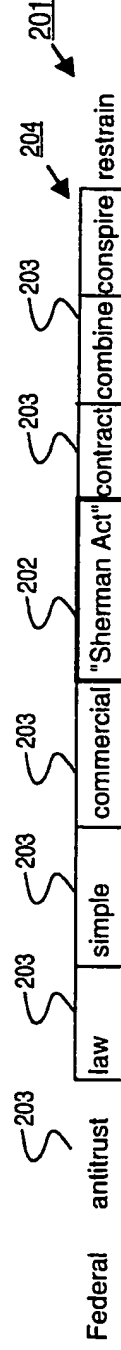
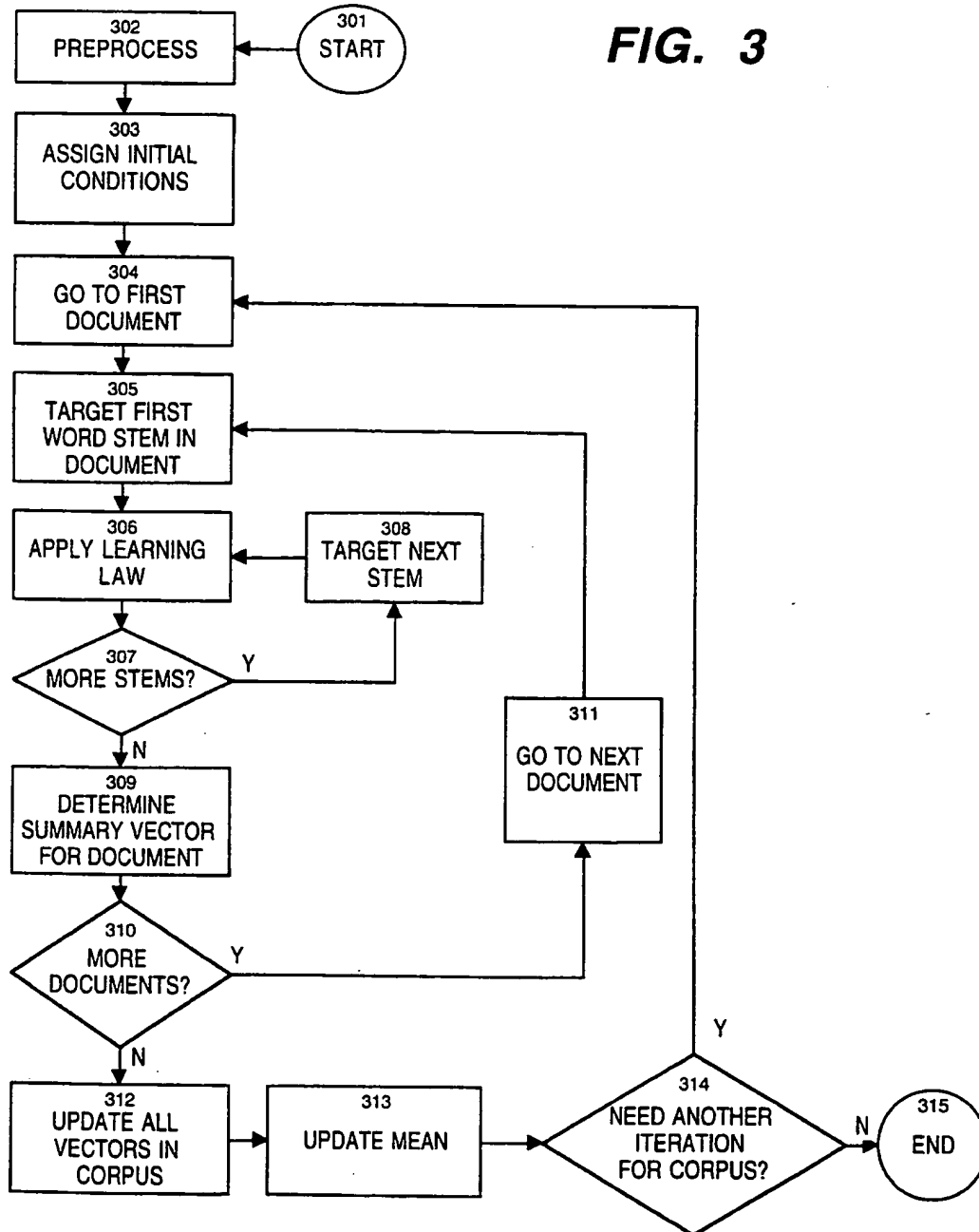


FIGURE 2F

FIG. 3



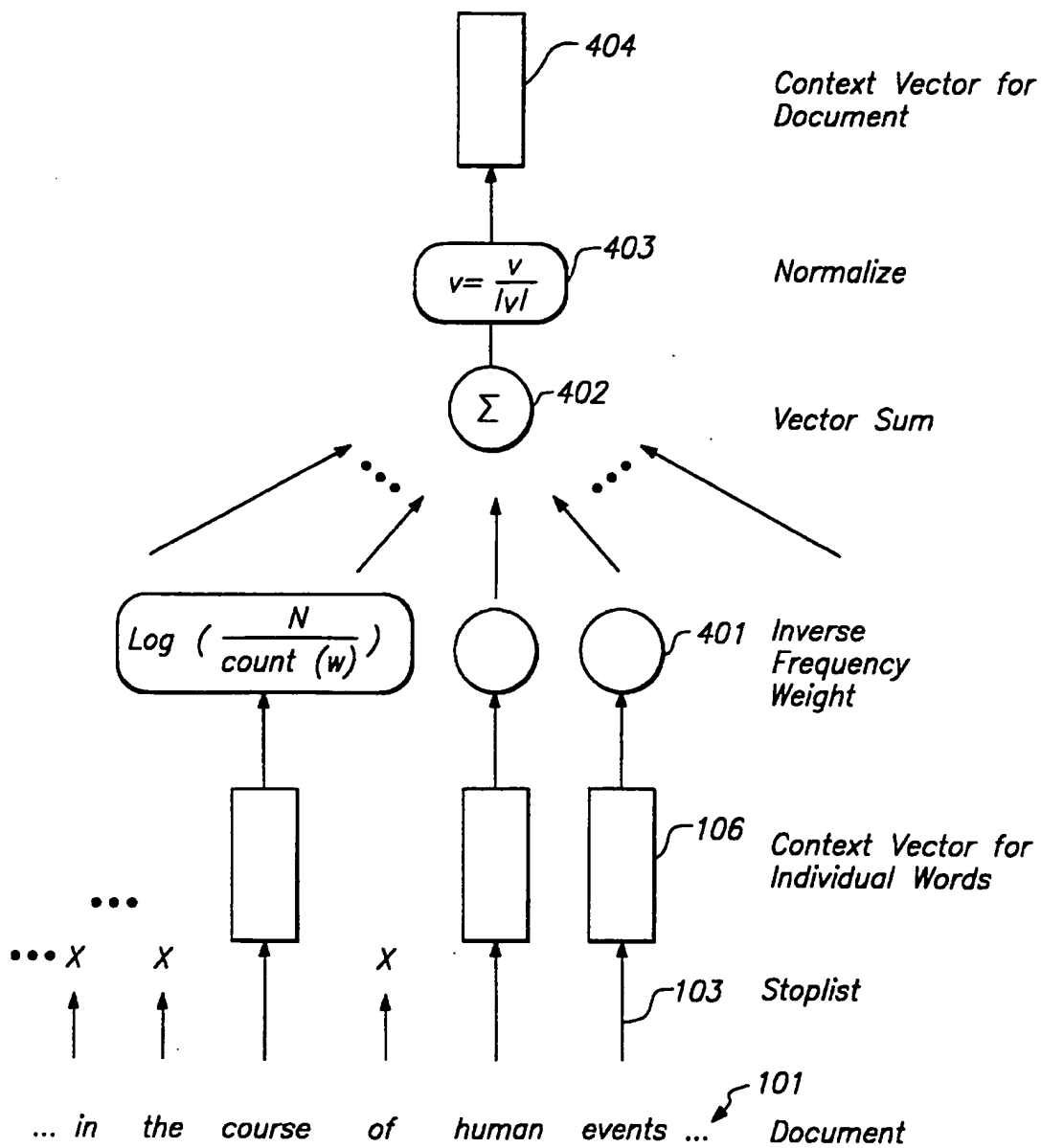
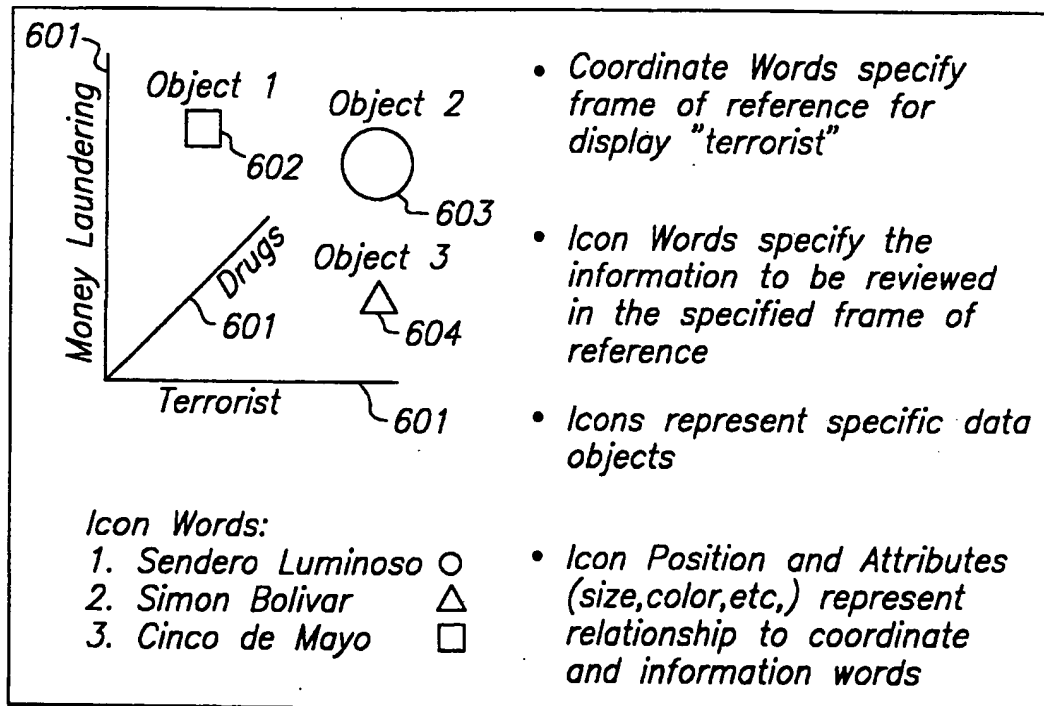


FIG. 4



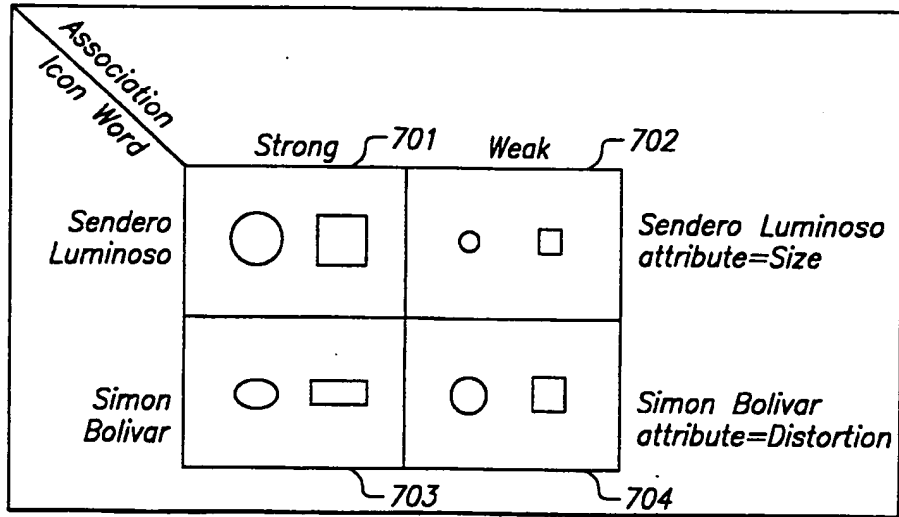


FIG. 7

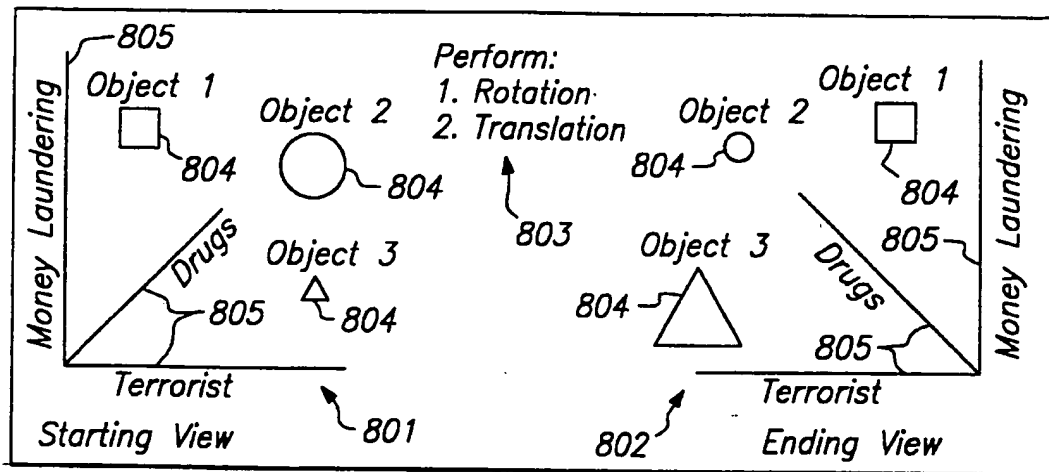


FIG. 8

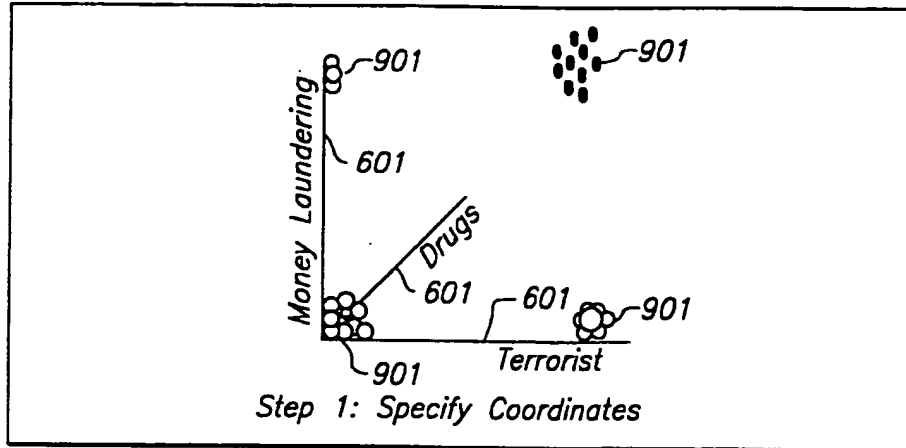


FIG. 9A

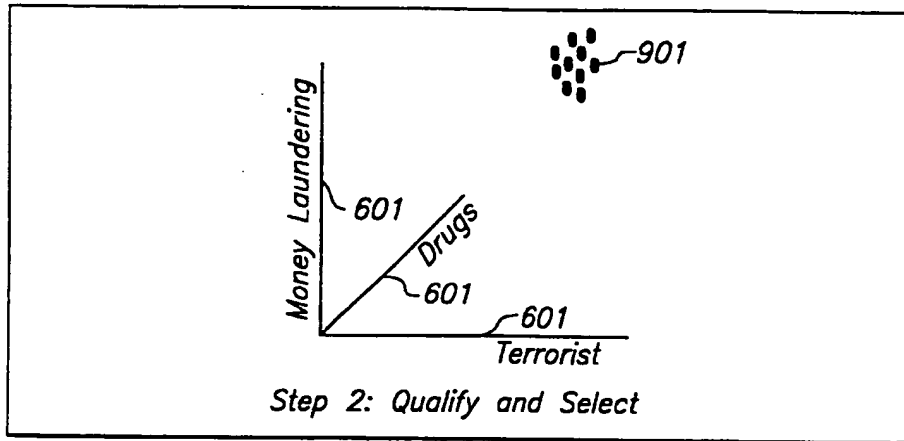


FIG. 9B

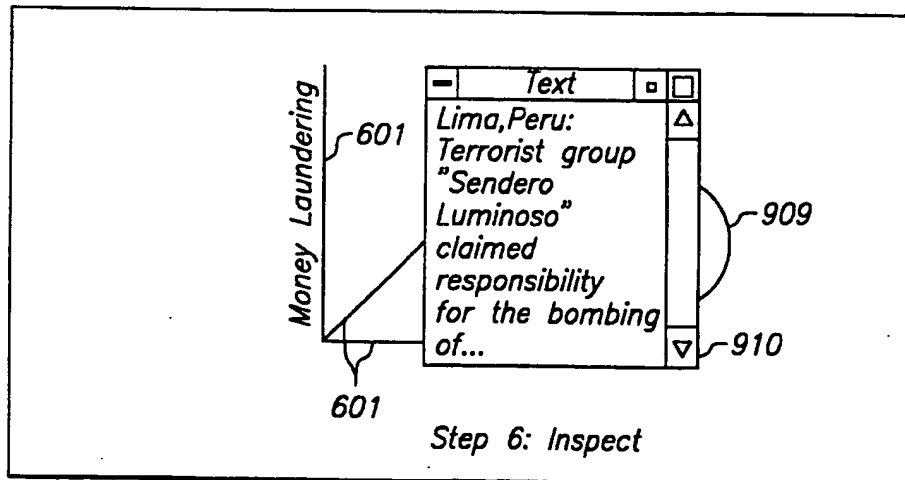


FIG. 9C

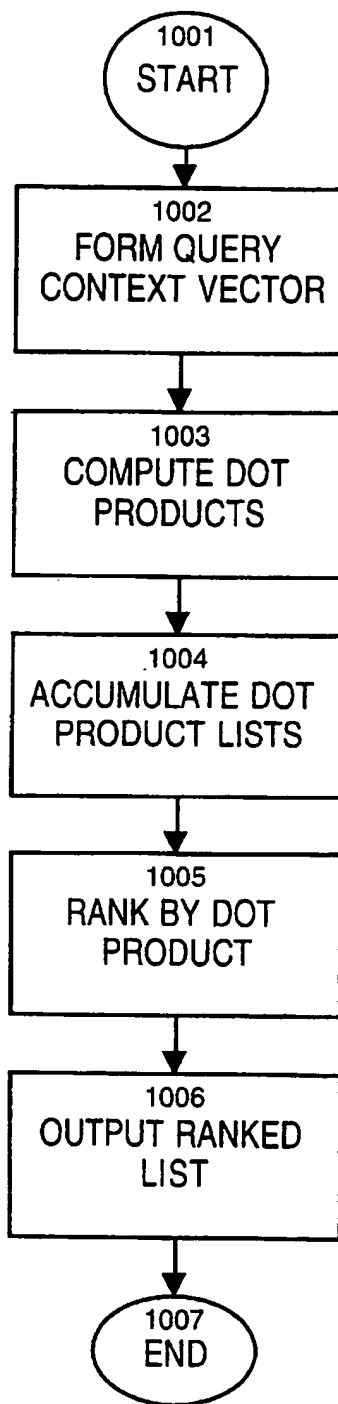


FIG. 10

```

1102
ACCEPT QUERY FROM
USER

```

1103
SEPARATE QUERY INTO
COMPONENTS

1104
ASSIGN DISPLAY
COORDINATE OR
ATTRIBUTE FOR EACH
COMPONENT

```

1105 GET CONTEXT VECTOR
      FOR EACH COMPONENT

```

1106
FOR EACH DOCUMENT
DETERMINE DOT
PRODUCT OF DOCUMENT
SUMMARY VECTOR WITH
EACH COMPONENT
CONTEXT VECTOR

1107
SUPPLY RESULTS TO
DISPLAY ENGINE

1108
END

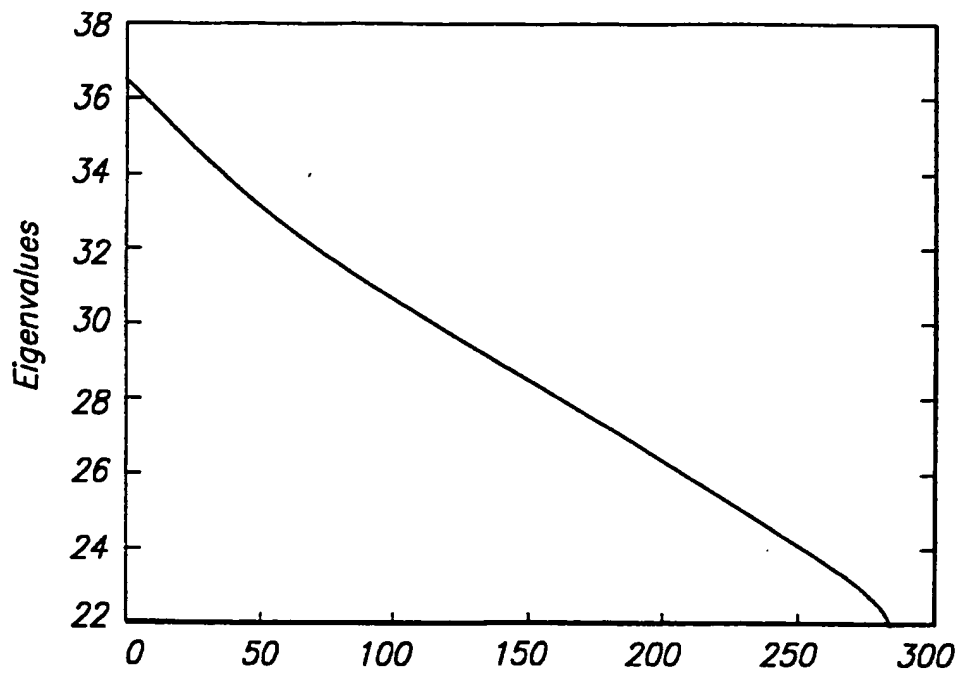


FIG. 12

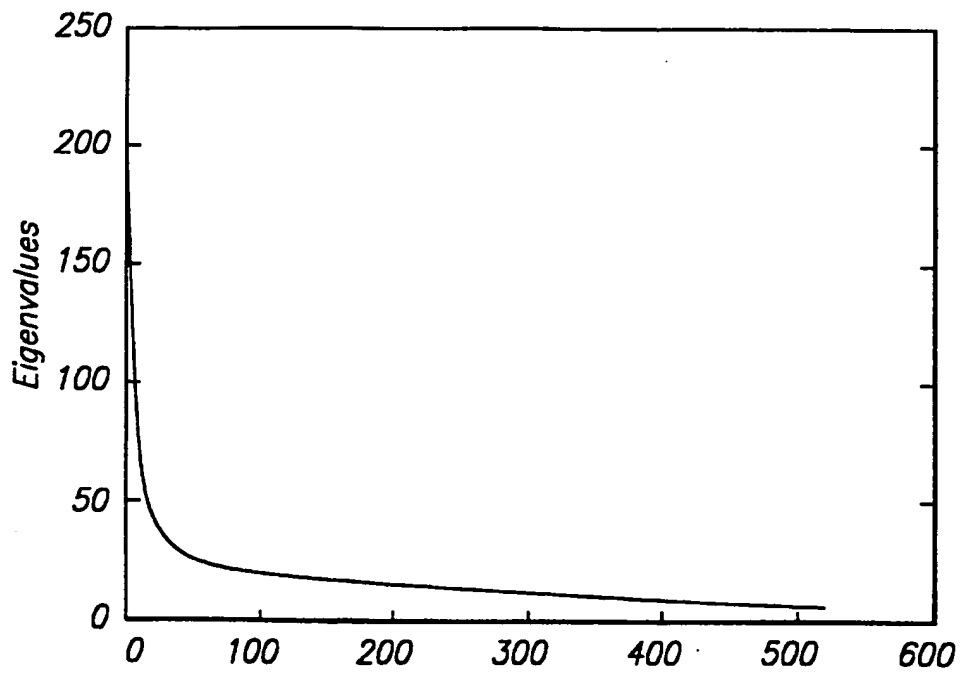


FIG. 13

002200-2222960

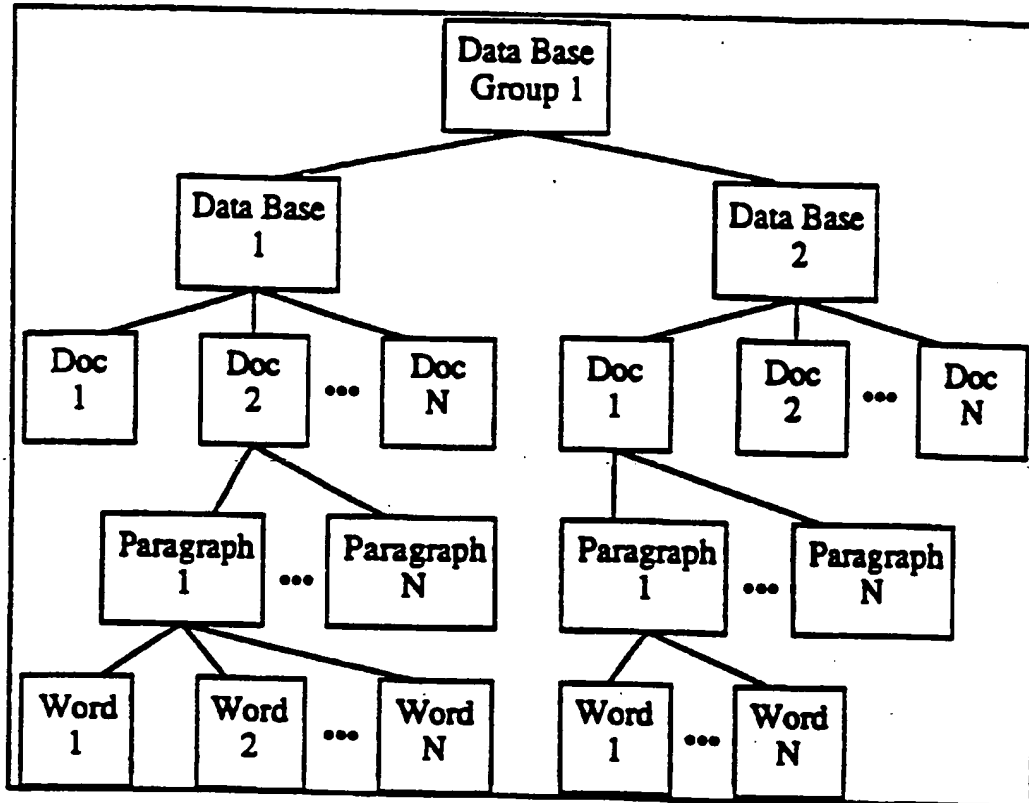


FIGURE 14

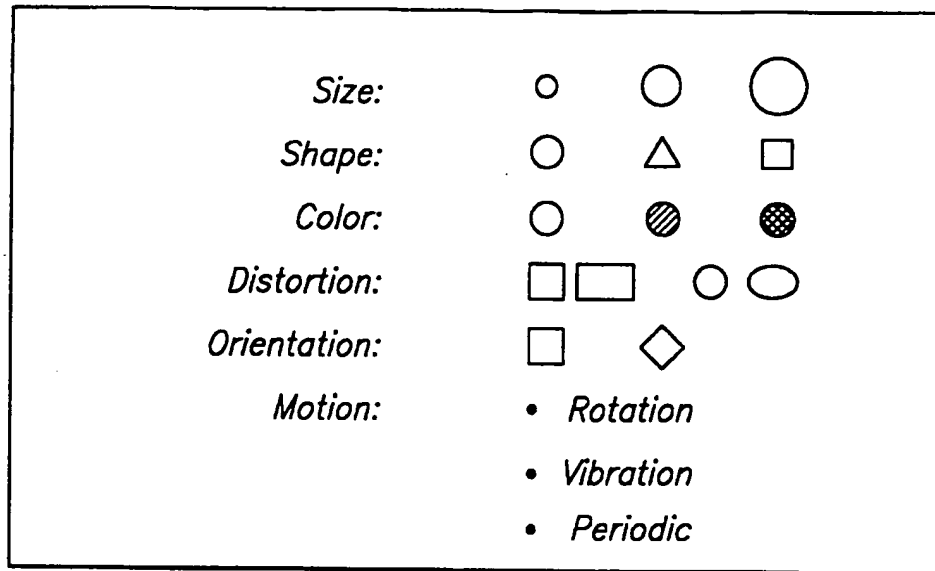


FIG. 15

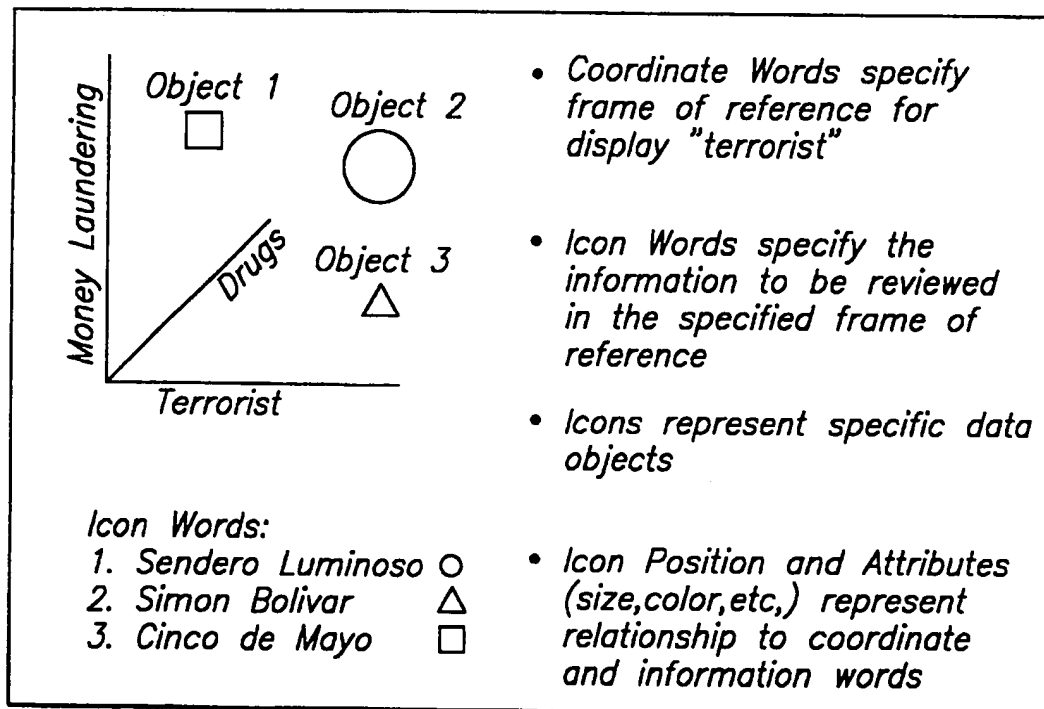


FIG. 16


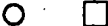


<div> <div>Association</div> <div>Icon Word</div> </div>	Strong	Weak	
	<div> <div>Sendero Luminoso</div> <div>  </div> </div>	<div> <div>Sendero Luminoso</div> <div>  </div> </div>	Sendero Luminoso attribute=Size
	<div> <div>Simon Bolivar</div> <div>  </div> </div>	<div> <div>Simon Bolivar</div> <div>  </div> </div>	Simon Bolivar attribute=Distortion

FIG. 17

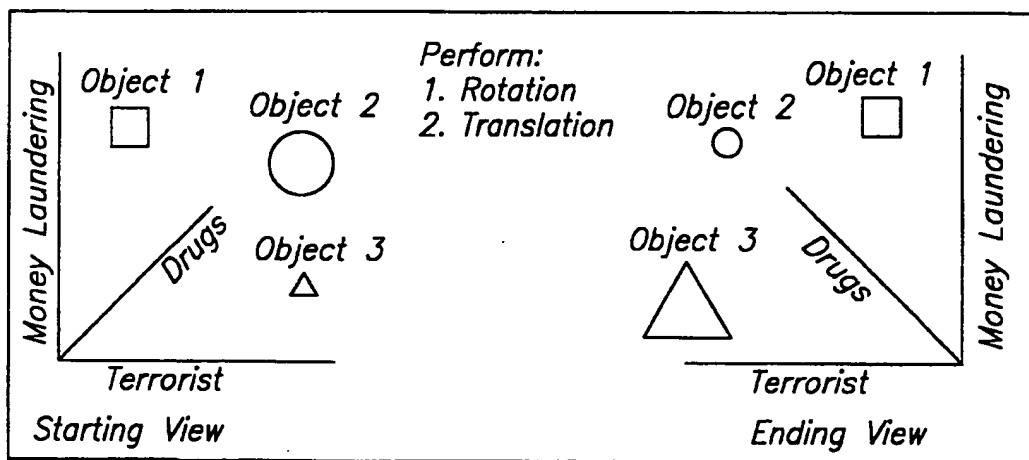


FIG. 18

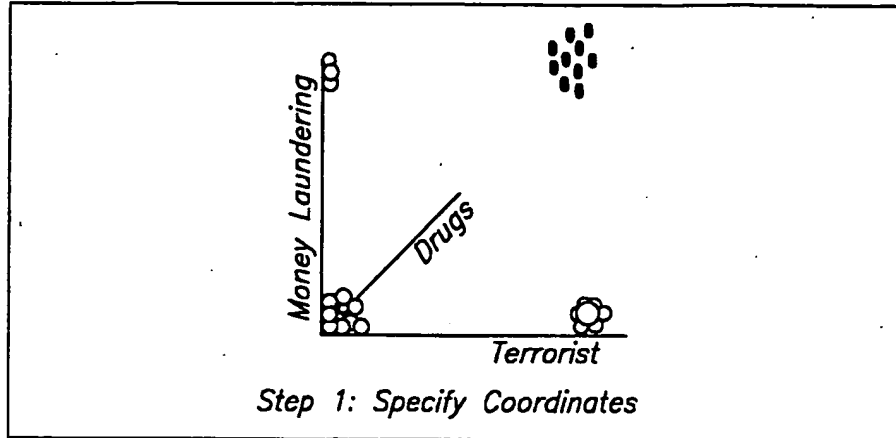


FIG. 19

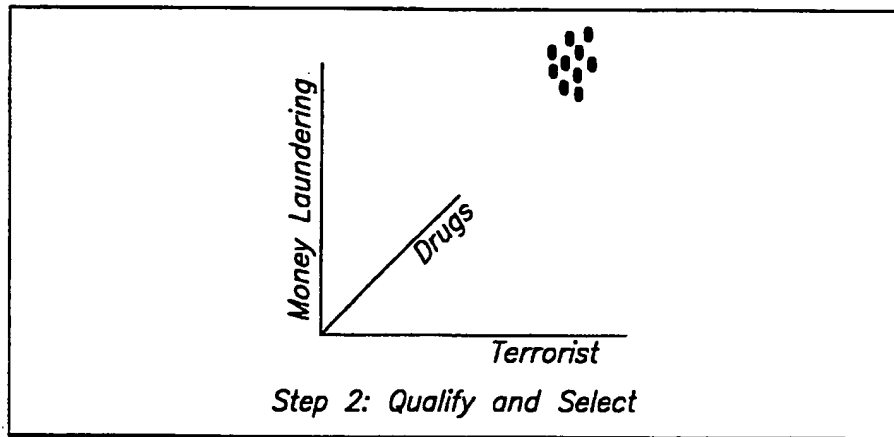


FIG. 20

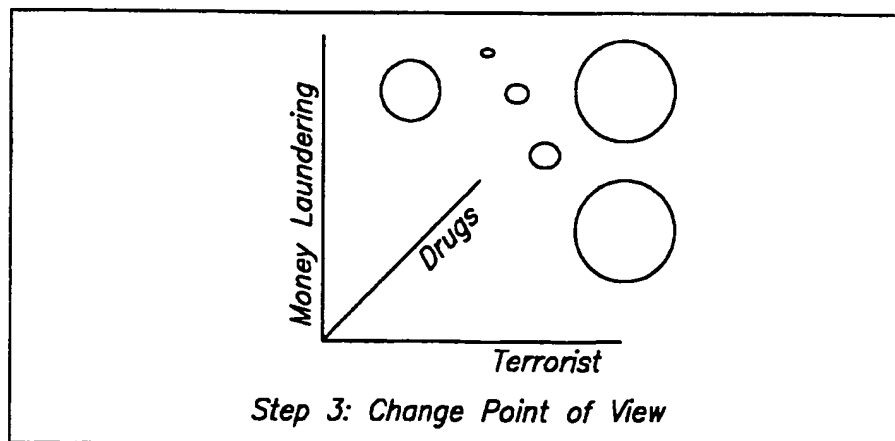
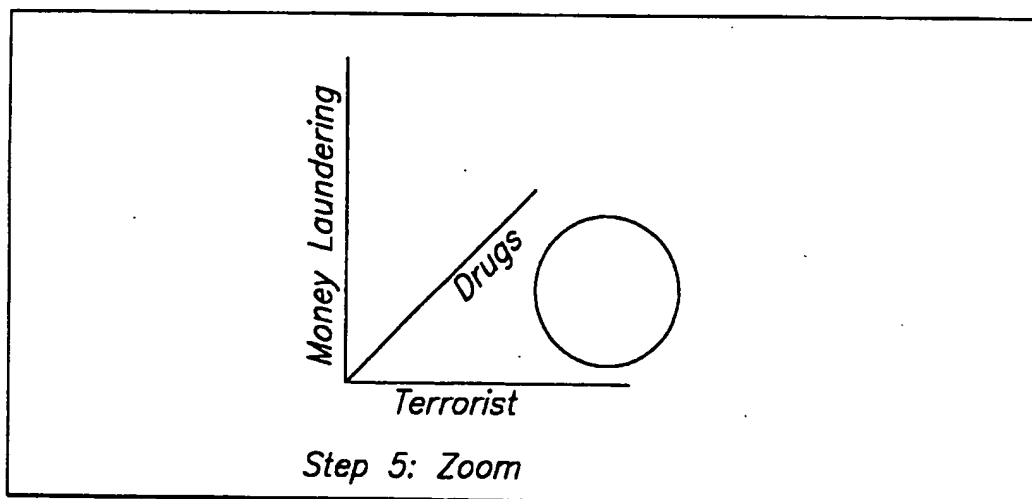
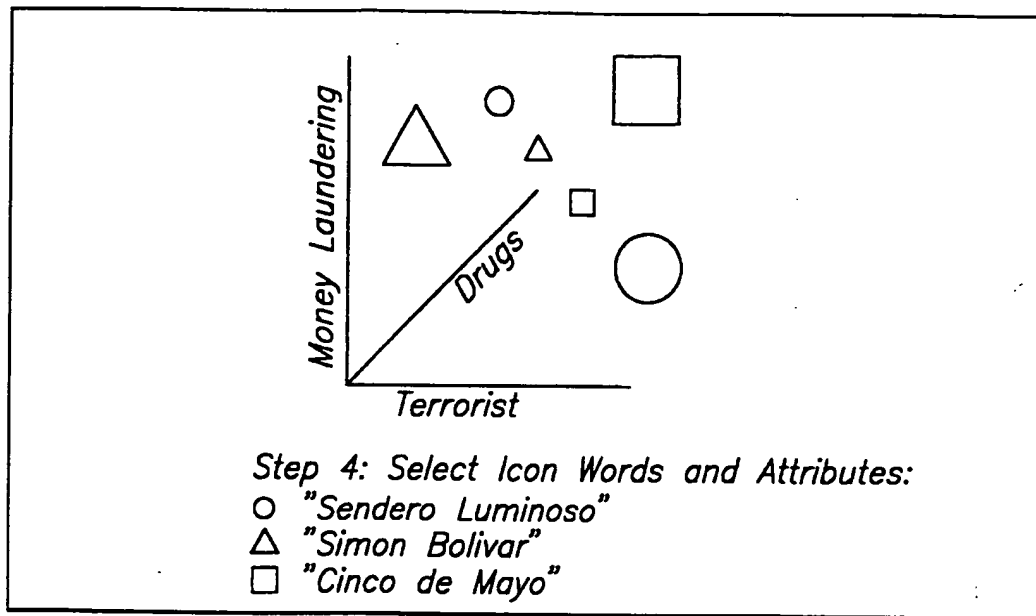


FIG. 21



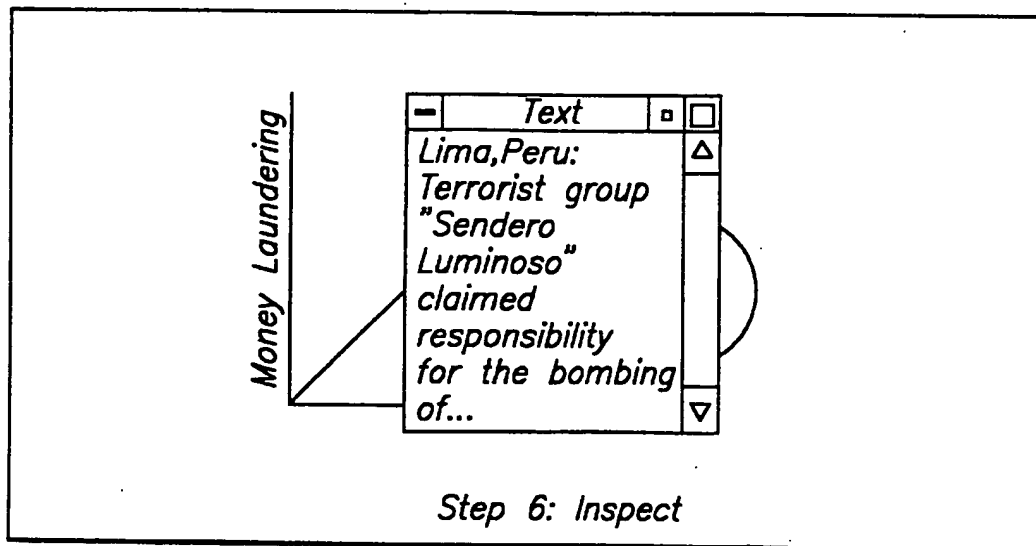


FIG. 24

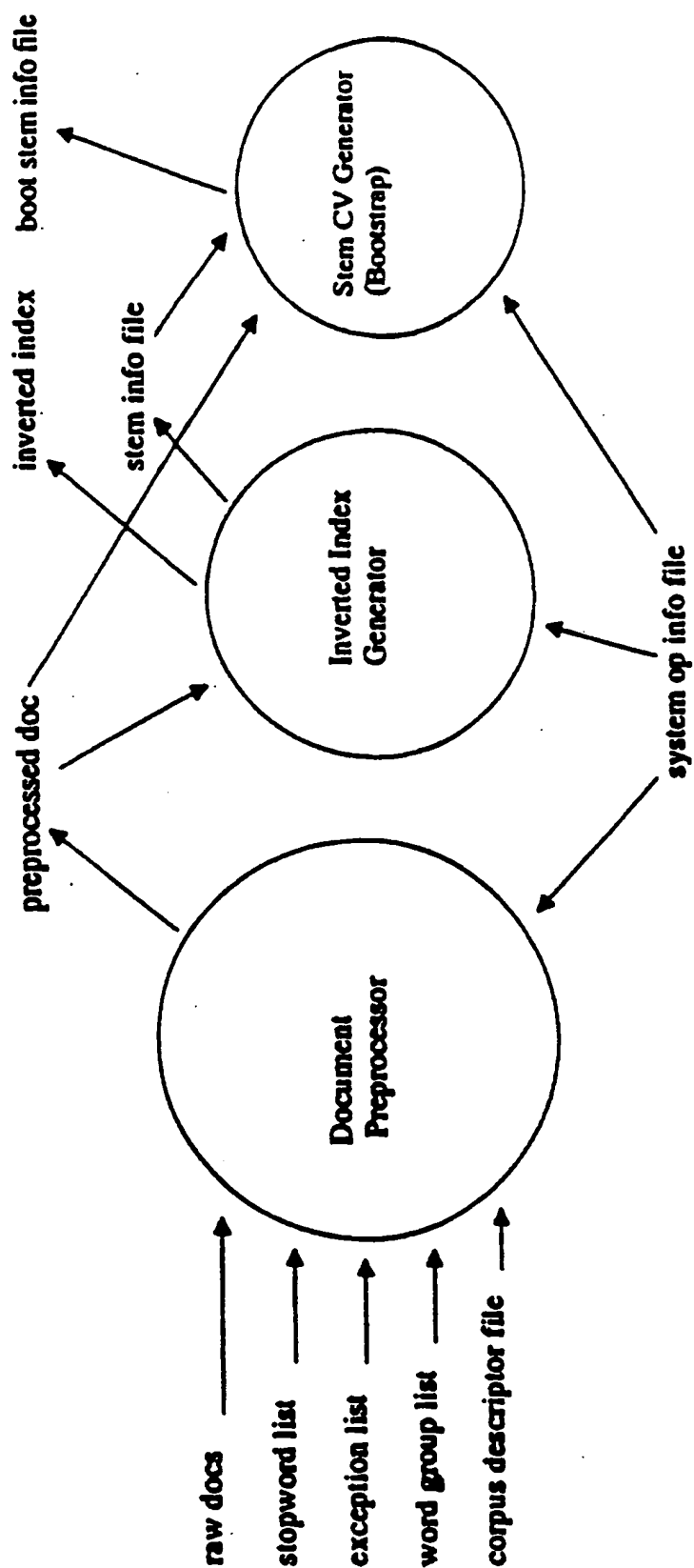


FIGURE 25

[illegible]

**Note: uses boot stem
info file if word senses
not generated**

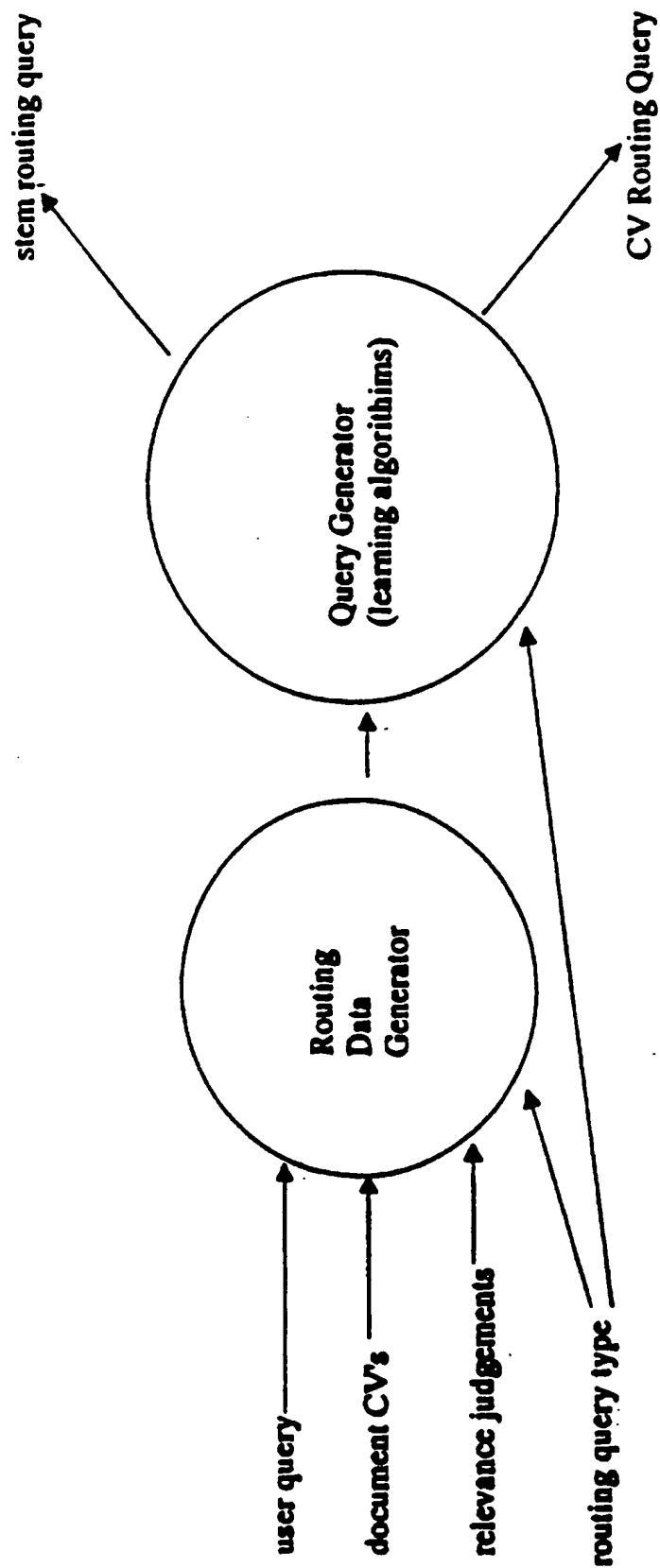


FIGURE 27

Routing Query Generation

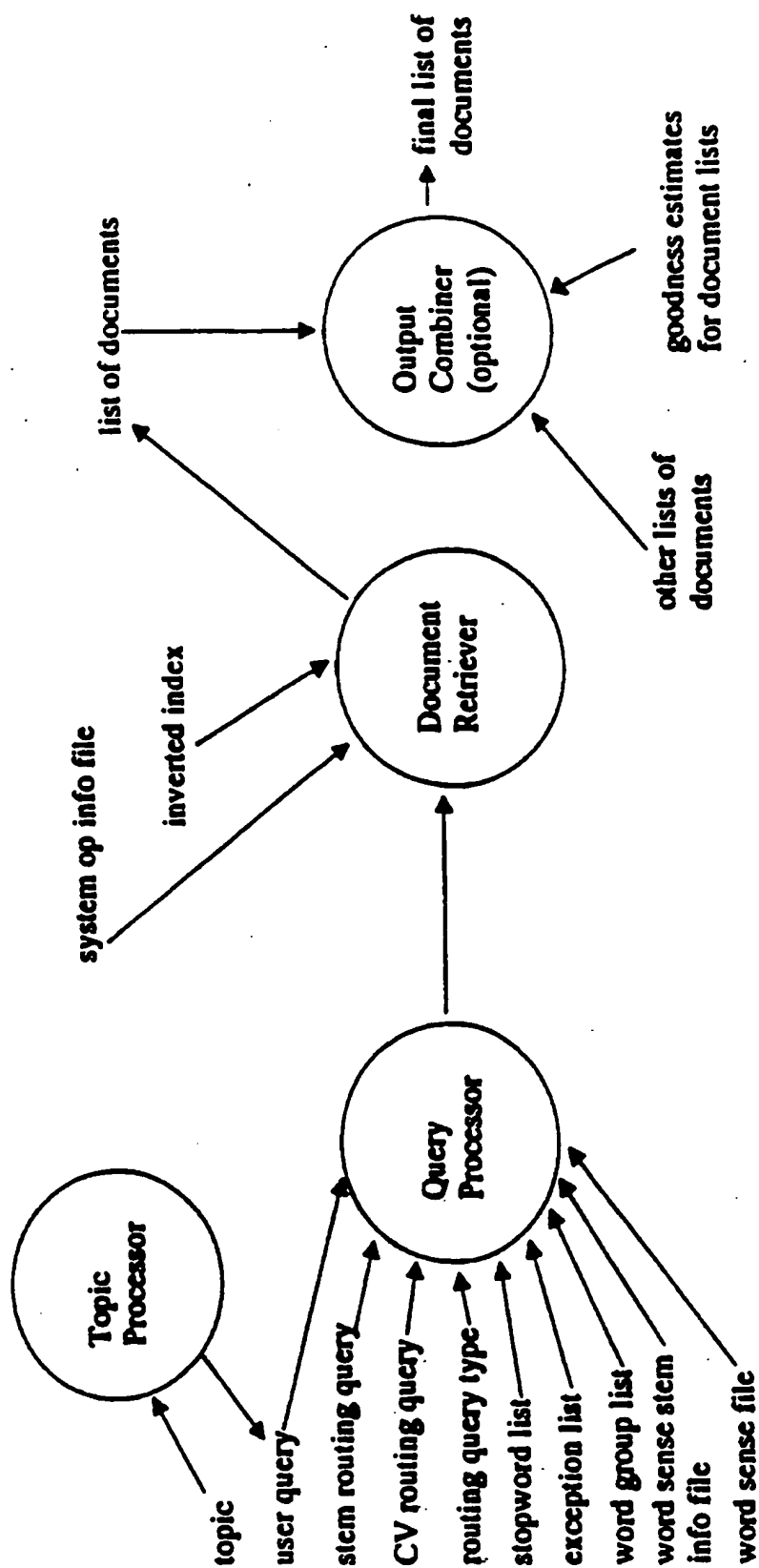


FIGURE 28

Retrieval

```
graph TD
    Input[101 Input] <--> Processor[102 Processor]
    Processor <--> Display[120 Display]
    Processor <--> Storage[104 Storage]
    Storage --> IDB[106 Image Database]
    subgraph 110 [ ]
        direction TB
        FVG[110 Feature Vector Generation]
        CVG[114 Context Vector Generation]
        R[118 Retrieval]
        I[116 Indexing]
        C[117 Clustering]
        FVG --> PFG[112 Prototypical Feature Vector Generation]
    end
    Processor <--> 110
```

FIG. 29

```
graph TD; 106[Image Database] --> 201((Images)); 201 --> 203[System Initialization]; 203 --> 205((Atomic Vocabulary)); 203 --> 207((Stop List)); 205 --> 209[Atomic Bootstrapping]; 207 --> 209; 209 --> 211((Atom Context Vectors)); 211 --> 213[Generate Summary Context Vectors for each Image]; 201 --> 213; 213 --> 215((Characterized Images));
```

The flowchart illustrates the system architecture for image characterization. It begins with an **Image Database** (106) which feeds into an **Images** node (201). From the **Images** node, the process branches into two parallel paths: one leading to **System Initialization** (203) and another leading to **Atomic Bootstrapping** (209). The **System Initialization** step generates an **Atomic Vocabulary** (205) and a **Stop List** (207), both of which are inputs to the **Atomic Bootstrapping** process. The **Atomic Bootstrapping** process produces **Atom Context Vectors** (211). These vectors, along with the original **Images** (201), are used in the **Generate Summary Context Vectors for each Image** step (213). The final output of this process is the **Characterized Images** (215).

FIG. 30

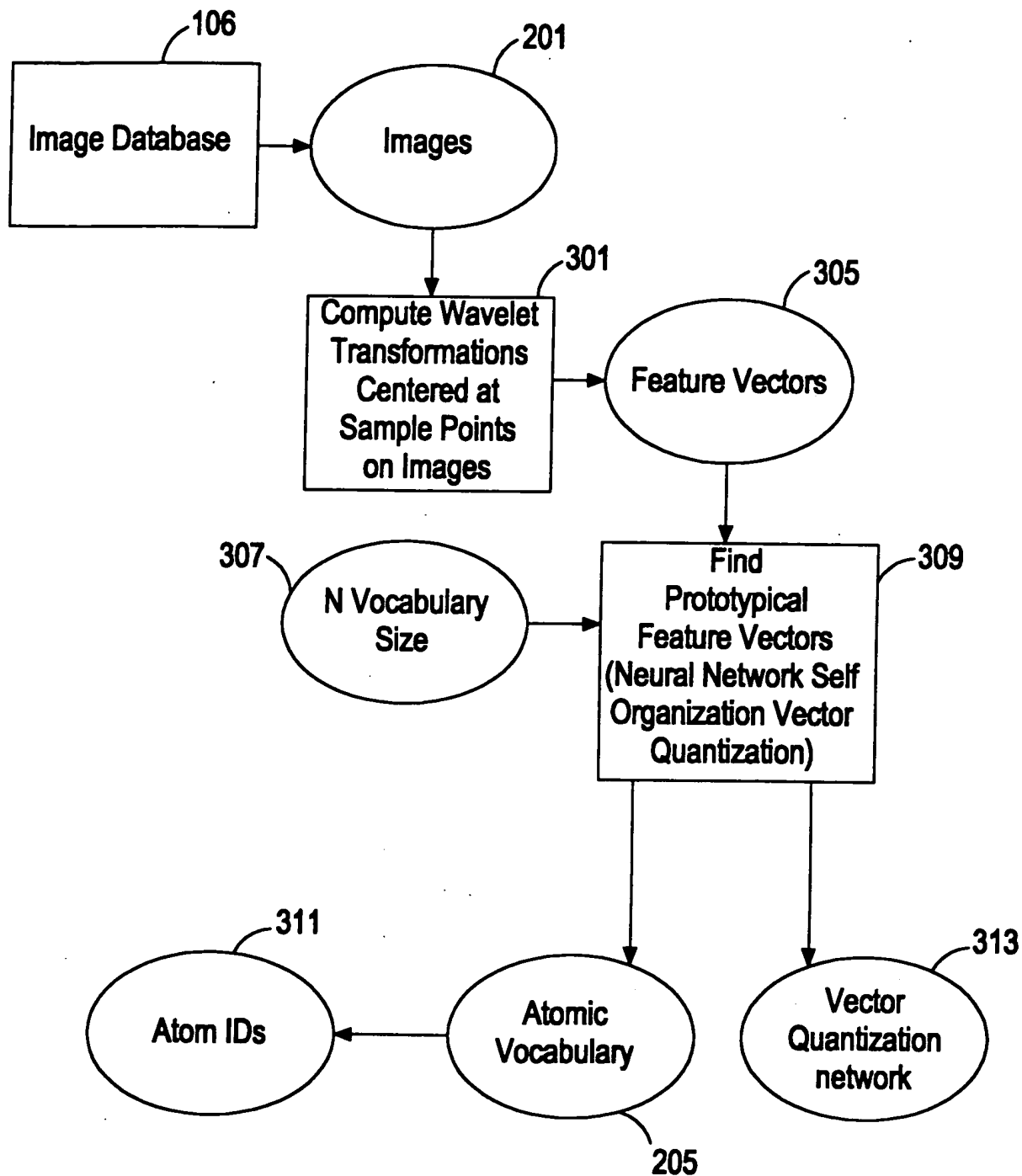


FIG. 31

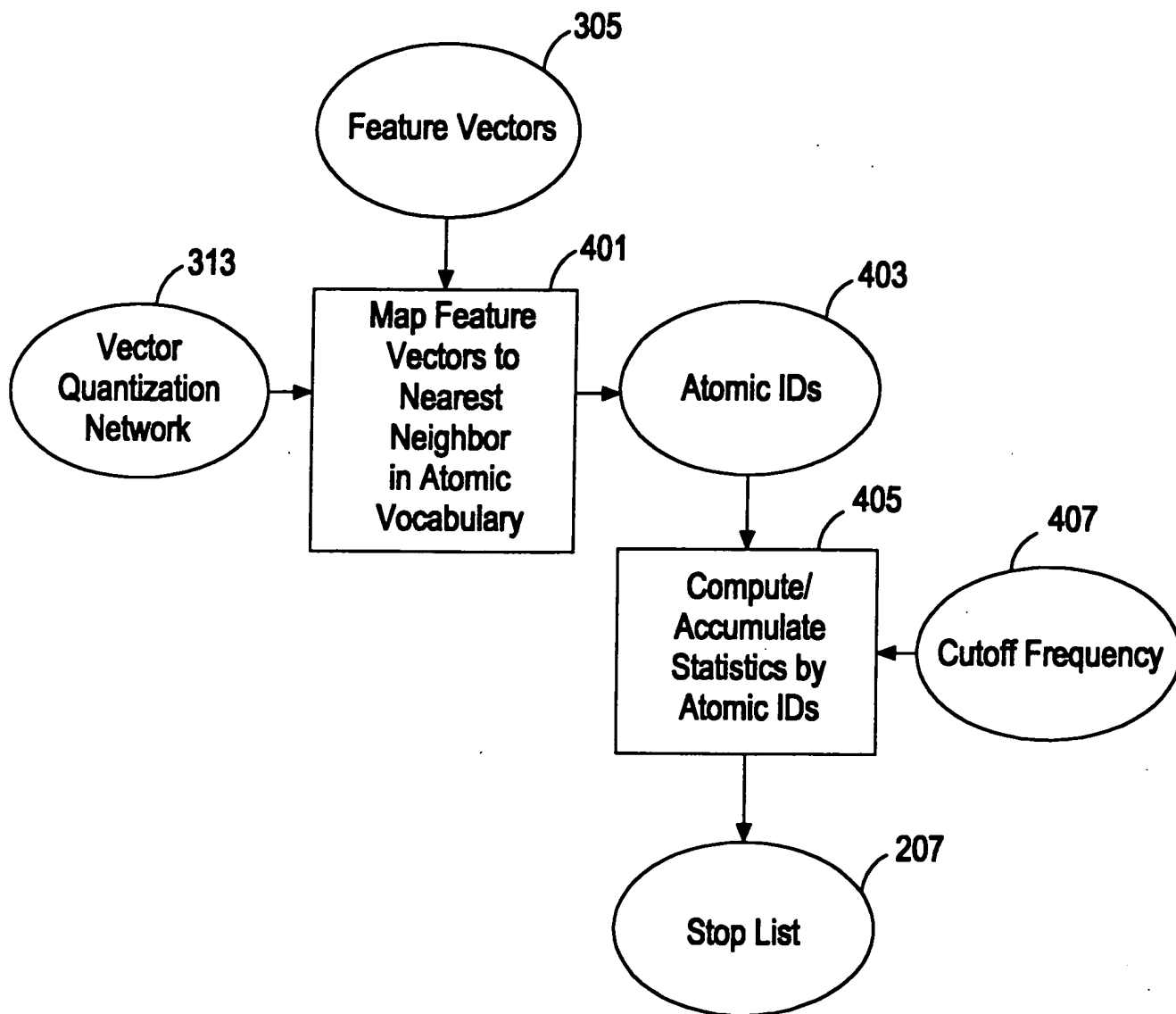


FIG. 32

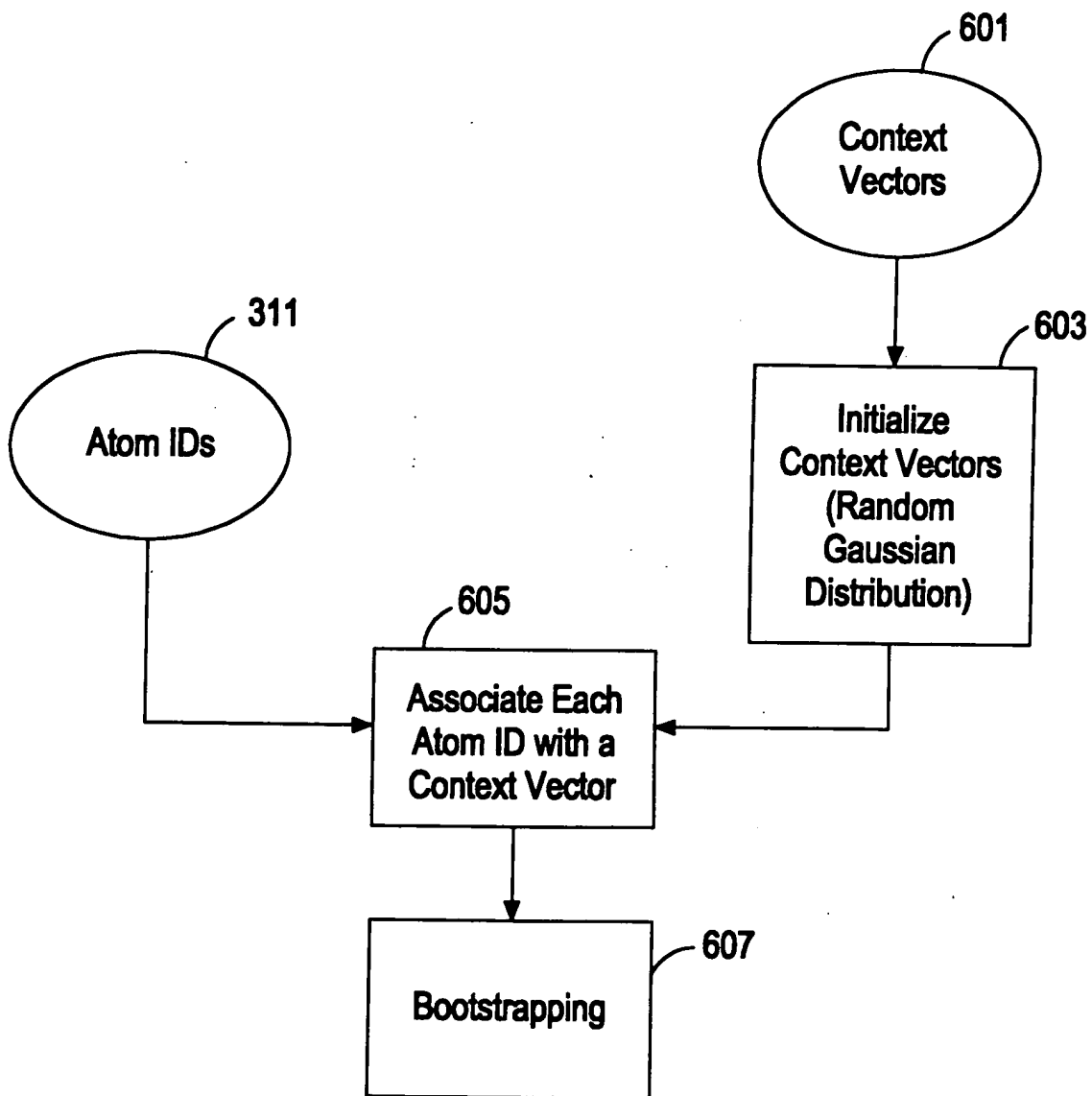


FIG. 34

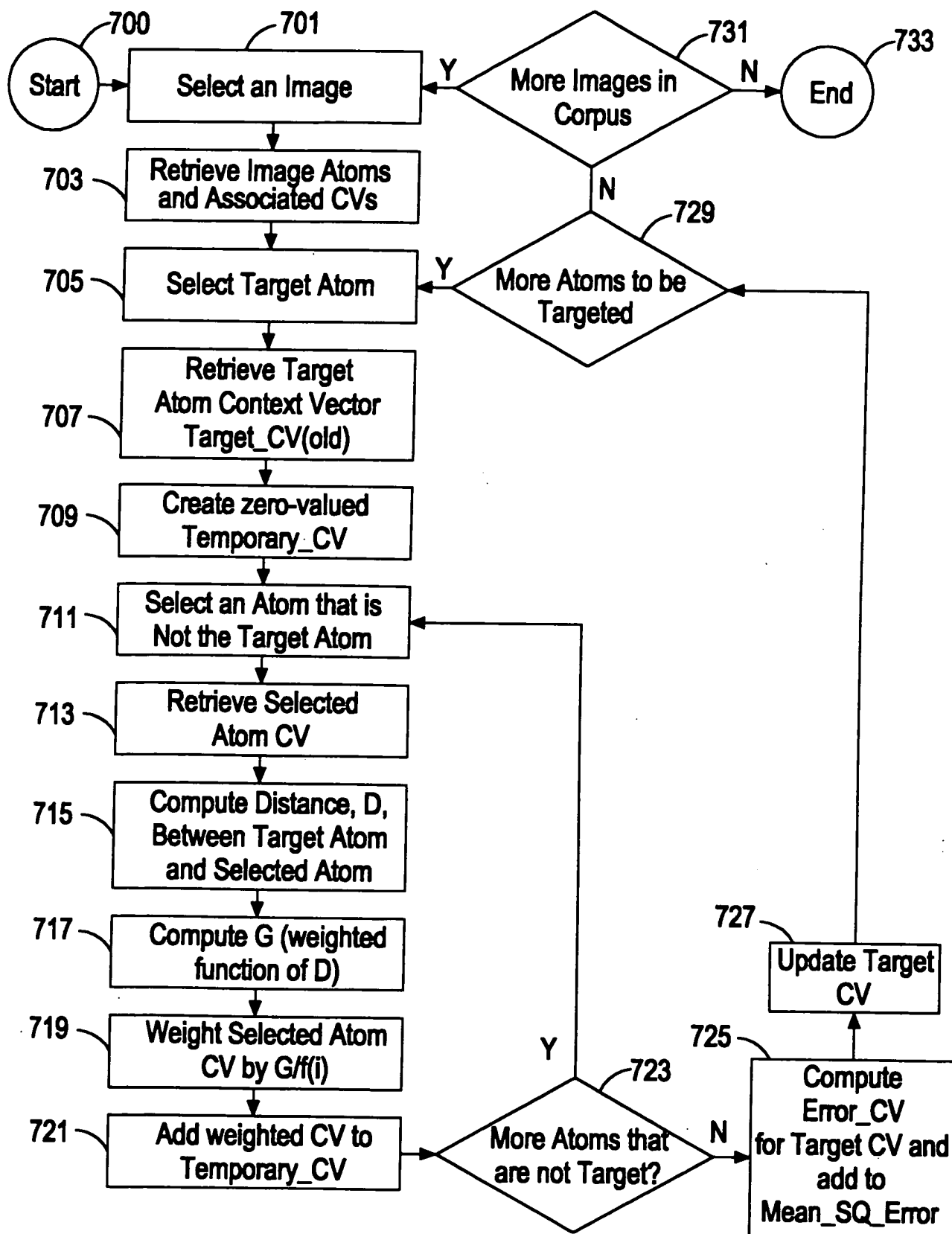


FIG. 35

The diagram shows a grid of points. A central point is labeled "TARGET". Several other points are shown around it. Lines connect the "TARGET" point to five other points: one directly above, one directly below, one to the left, one to the right, and one to the upper-left. The distance from the "TARGET" point to the point directly above it is labeled D_i .

FIG. 36

```

graph TD
    Start((Start)) -- 900 --> ImageAtom([Image Atom(i)])
    ImageAtom -- 901 --> Decision1{Atom(i) on Stop List?}
    StopList([Stop List]) -- 207 --> Decision1
    Decision1 -- Yes 902 --> ImageAtom
    Decision1 -- No 902 --> RetrieveCV[Retrieve Atom(i) CV]
    RetrieveCV --> WeightCV[Weight Atom CV by 1/ln(N)]
    WeightCV --> Accumulate[Accumulate/ Sum Weighted CVs]
    Accumulate --> Decision2{More Atoms for Image?}
    Decision2 --> Normalize[Normalize Vector Length]
    Normalize -- 911 --> ImageSummary([Image Summary Vector])
    ImageSummary -- 913 --> Stop((Stop))
    ImageSummary -- 915 --> Stop
    Decision2 --> ImageAtom

```

FIG. 37

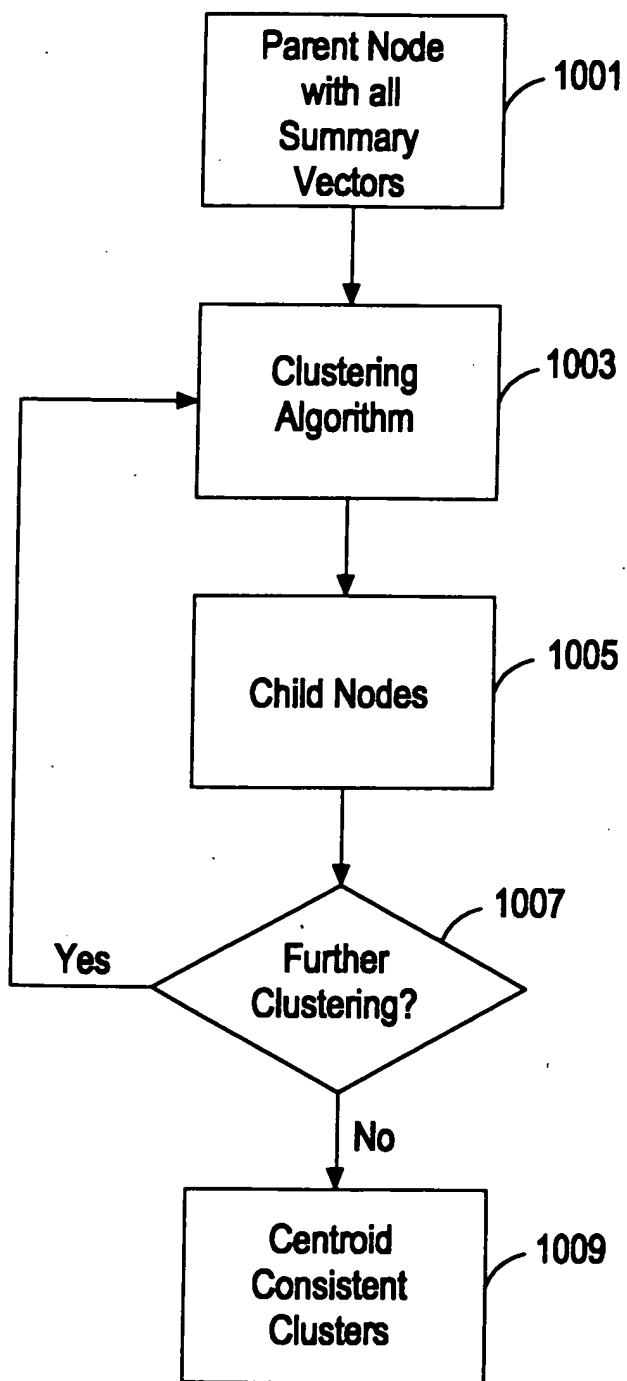


FIG. 38

```

graph TD
    1101[Assign Summary Vectors to k Clusters] --> 1103[Calculate Centroid Value of each Cluster (Average of Summary Vectors in Centroid)]
    1103 --> 1105[Assign Remaining Summary Vectors to Closest Centroid]
    1105 --> 1107[For Each Summary Vector, Compute Distance to Each Centroid]
    1107 --> 1109[Move Each Summary Vector to Closest Centroid, and Update Centroid Value]
    1109 --> 1111{More Summary Vectors to check?}
    1111 -- Yes --> 1107
    1111 -- No --> 1113{Convergence?}
    1113 -- No --> 1107
    1113 -- Yes --> 1115([Cluster Summary Vectors at Level N])

```

FIG. 39

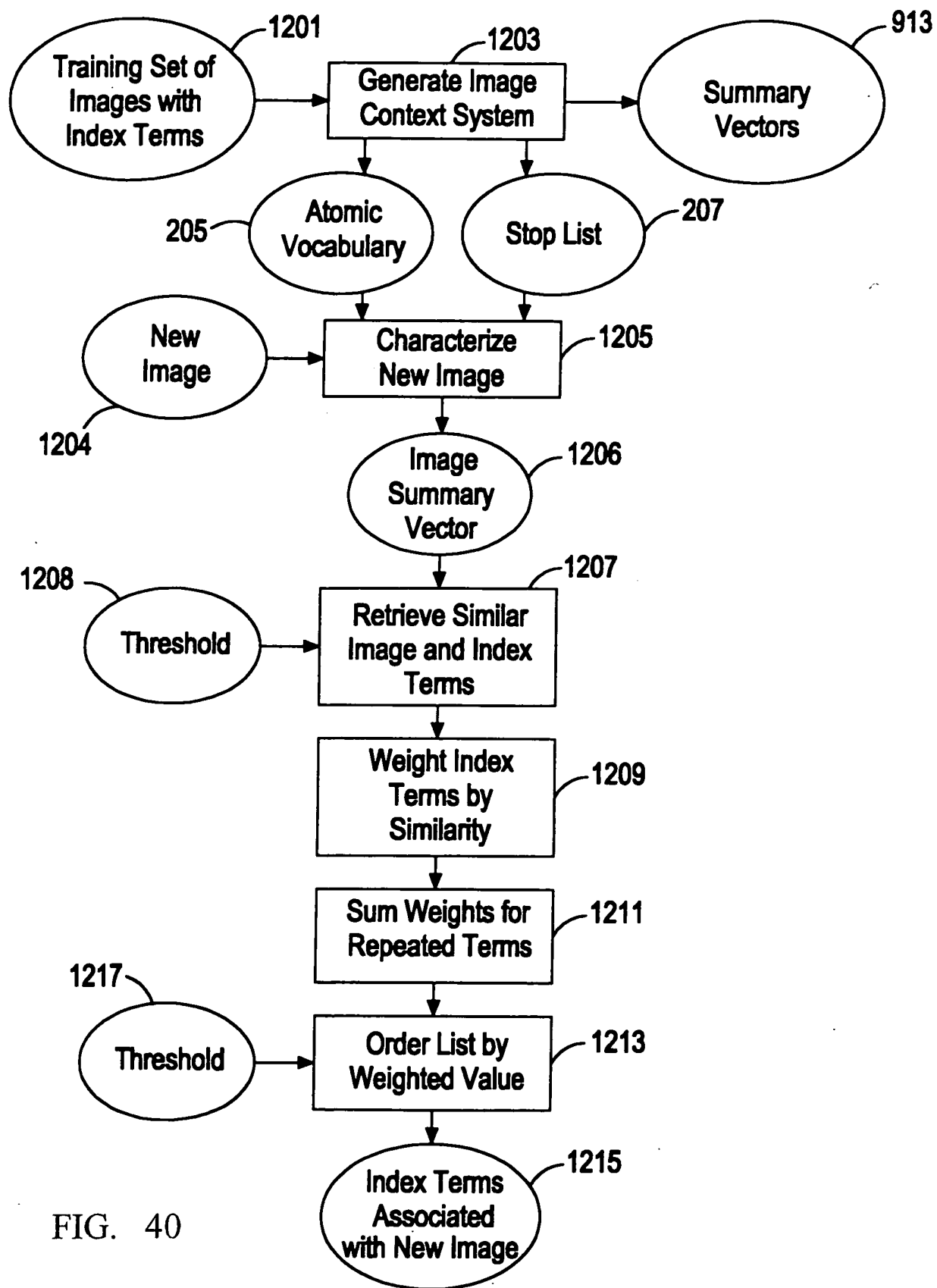


FIG. 40

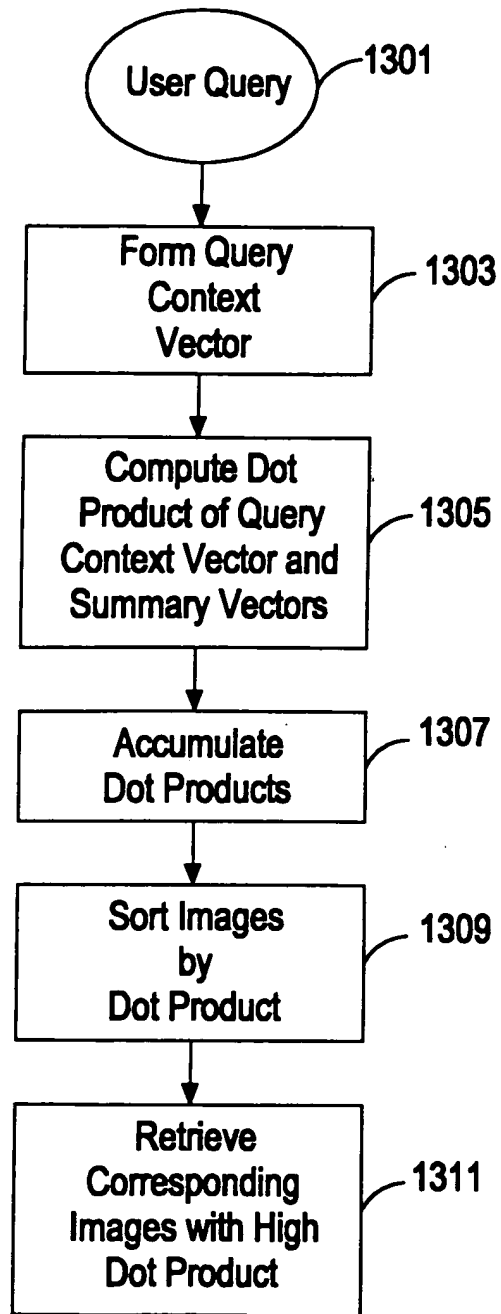


FIG. 41

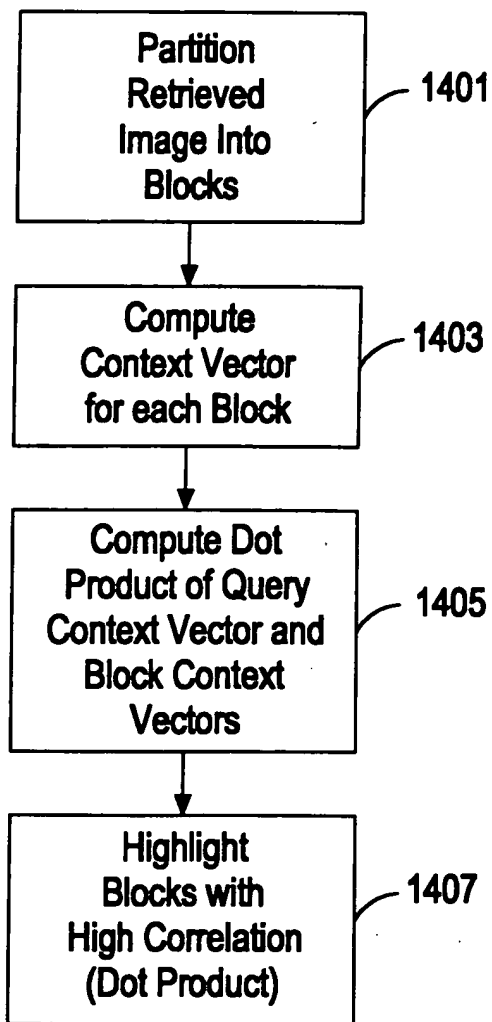


FIG. 42

002260-2222560

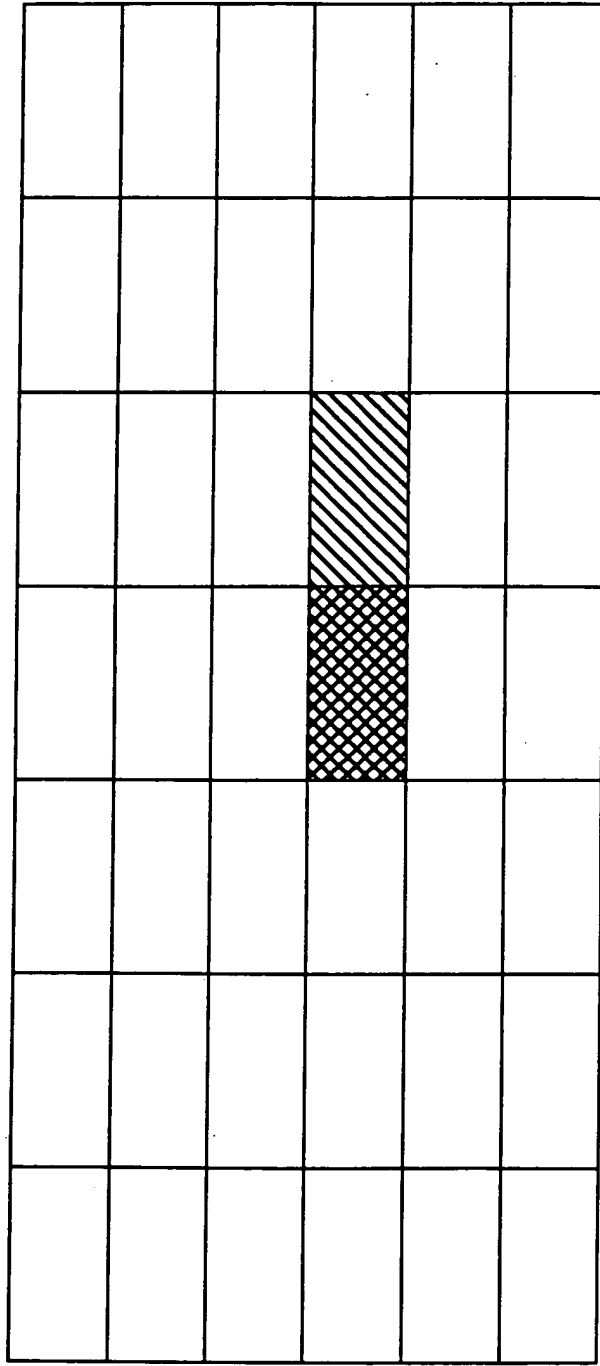


FIG. 43